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SECTION 4.0 PROJECTS AND METHODS

This chapter provides an overview of the YWG Basin's watershed health; forest health and wildfires; IPPs; and the education and public outreach component necessary to ensure that the BIP planning process represents the values and community needs of the Basin. The IPPs presented in this chapter are dynamic lists reflective of the current planning process. These lists will continue to be updated with new IPPs as the Basin continues to refine its water needs and its overall understanding of IPPs. The majority of information presented in this chapter was developed through stakeholder input and the 2014 P&M Study. The following bullets summarize consumptive and environmental and recreational IPPs and public outreach.

- Education and outreach strategies for the YWG BIP included advertisements, meetings, surveys, and stakeholder collaboration. The YWG BIP was advertised through various channels to inform as many residents of Northwest Colorado of the YWG BIP and to encourage them to attend outreach meetings, learn about the BIP process and respond to the YWG BRT. The purpose of the meetings was to inform water stakeholders about the Colorado Water Plan, the YWG BIP and their right/responsibility to provide input to the YWG BRT for the YWG BIP. Additional input was sought using two surveys distributed throughout the YWG Basin to gather details on existing or proposed consumptive and environmental/recreational IPPs. The draft report was posted for review using similar methods.
- Consumptive IPPs consist of projects that will address agricultural, M&I, and SSI water needs. Examples include reservoir enlargements, new storage projects, municipal water conservation, and expansion of municipal supply well fields. In addition to IPPs previously identified through the SWSI and the P&M Study, new projects were identified through surveys distributed throughout the Basin, and through additional discussions with the BIP Committee. The consumptive IPPs provide means to meet consumptive needs agricultural, M&I, and SSI needs, oftentimes in a collaborative manner. The YWG BRT will continue to explore additional multi-purpose opportunities where they may exist through future planning efforts.
- Seventeen environmental and recreational IPPs were identified to help meet environmental and recreational water supply needs. The environmental and recreational IPPs were also identified through surveys. These IPPs include studies, agreements, constructed projects, ecological improvements and other legal mechanisms that can be used to meet the environmental and recreational needs of the Basin.

4.1 EDUCATION, PARTICIPATION AND OUTREACH

Education, participation, and outreach efforts were essential for informing stakeholders and decision-makers of the existence and goals of the YWG BIP and Colorado Water Plan. These efforts also informed YWG Basin residents of the Colorado Water Plan and provided a mechanism to comment on the YWG BIP's content. Existing and new IPPs were identified during the outreach process through the use of surveys. The surveys and the results are discussed in further detail in Section 4.1.3 and Section 4.2. Appendix B contains the public outreach reports, public comments, and a summary table of those comments.

4.1.1 Advertisement

Advertising for the YWG BIP was approached in a variety of venues with the intent to inform as many residents of Northwest Colorado of the pending plan and to encourage them to attend an outreach meeting, learn about the YWG BIP process and respond to the YWG BRT. All advertising was done during February prior to the meetings.

- 2000 flyers were inserted into a weekly edition of *The Rio Blanco Herald Times*. The flyer was two sided: the front side explained the Colorado Water Plan, and the back side informed people of meetings in northwest Colorado and of response opportunities.
- 747 postcards were mailed to residents in Rio Blanco County and 353 to residents in Moffat County informing them of meeting dates and response opportunities.



- 150 postcards were hand-distributed at various meetings in Steamboat Springs.
- Email postcards (for further outreach distribution) were sent to almost 60 organizations, agencies, and groups informing them of the meeting dates and encouraging them to spread the word, have board members attend a meeting and submit recommendations to the YWG BRT. A summary of the groups contacted is provided below.
 - YWG BRT members
 - Commissioners Offices for Routt, Rio Blanco, Moffat Counties
 - Administrative Offices for the towns of Yampa, Oak Creek, Steamboat, Hayden, Craig, Dinosaur, Meeker, and Rangely
 - Chambers of Commerce in Steamboat Springs, Craig, and Meeker
 - Economic Development Councils in South Routt, Steamboat Springs, Craig
 - Colorado State University Extension Offices in Routt, Rio Blanco and Moffat Counties
 - Conservation District Offices in Routt, Rio Blanco and Moffat Counties
 - Regional offices of federal government agencies: NRCS, USFS, Farm Service Agency (FSA)
 - Local organizations in Routt, Rio Blanco and Moffat: Agriculture Groups, Habitat Programs, Environmental Groups,
 - Health Care Groups, and Tourism/Recreation Groups
- Five print advertisements were placed in *The Steamboat Pilot* and two in the *Craig Daily Press* informing people of the meeting dates.
- Flyers were posted in “gathering spots” in Steamboat Springs, Craig and Meeker. The flyer was two sided: the front side explained the Colorado Water Plan, and the back side informed people of meetings in northwest Colorado and response opportunities. In addition the flyer was sent to all of the above-listed organizations, agencies and groups asking them to post the notice.
- Personal invitations were extended by Community Agriculture Alliance staff and board, YWG BRT Members, Colorado State University Extension staff and Conservation District staff.

4.1.2 Meetings

Five outreach meetings were held in the YWG Basin in February and early March 2014, reaching a total attendance of 267 people. The purpose of the meetings was to inform water stakeholders about the Colorado Water Plan, the BIPs and their right/responsibility to provide input to the YWG BRT for the YWG BIP. The meetings (Presentations were also made to the annual meetings of the following conservation districts:

- | | |
|--|----------------------------|
| ▪ White River Conservation District | Meeker, January 10, 2015 |
| ▪ Colorado First Conservation District | Craig, February 17, 2015 |
| ▪ Douglas Creek Conservation District | Rangely, February 28, 2015 |

Table 4-1) were structured using the same format and were facilitated by YWG BRT members from each respective area. A PowerPoint presentation, which originated from the CWCB, was revised to contain pertinent information about the three river basins in northwest Colorado. Demographic questions asked at each meeting allowed the YWG BRT to ascertain which river basin people called home, which county they lived in, their primary use of water and what they considered the most important use of water. A comment/question/answer period concluded each meeting. Meeting highlights are summarized in Table 4-2. Presentations were also made to the annual meetings of the following conservation districts:

- | | |
|--|----------------------------|
| ▪ White River Conservation District | Meeker, January 10, 2015 |
| ▪ Colorado First Conservation District | Craig, February 17, 2015 |
| ▪ Douglas Creek Conservation District | Rangely, February 28, 2015 |



Table 4-1 Summary of YWG Public Outreach Meetings

Date Completed	Location	Participation	BRT Members Involved
Feb 6, 2014 Thursday	Rangely CNCC	41 Attended 37 Registered 24 Used Public Poll	Jeff Devere Jon Hill Dan Eddy Alden Vanden Brink Ren Martyn
Feb 13, 2014 Wednesday	Steamboat Springs Community Center	98 Attended 88 Registered	Kevin McBride Jay Gallagher Doug Monger Tom Sharp Geoff Blakeslee Dan Craig Steve Colby Jackie Brown Ren Martyn Tom Gray Don Jones
Feb 19, 2014 Wednesday	Craig American Legion	50 People Attended 46 Registered 43 Used Public Poll	Tom Gray Don Jones Burt Clements Doug Monger
Feb 24, 2014 Monday	Meeker Rio Blanco Fairgrounds	58 People Attended 56 People Registered 48 Used Public Poll	Jeff Devere Jon Hill Al Vanden Brink Ren Martyn
March 11, 2014 Tuesday	Browns Park Browns Park School	20 People Attended 18 People Registered 16 Used Public Poll	T Wright Dickinson Ren Martyn

Table 4-2 Demographic Results of BIP Public Outreach Meetings

Outreach Meeting	"Home Basin"	County Live In	Primary Use of Water	Most Important Use of Water
Rangely (24 respondents)	2 Yampa 22 White	3 Moffat 21 Rio Blanco	17 Agriculture 4 Municipal/Industrial 3 Recreation	#1 Agriculture #2/3 Tie: Energy & Municipal/Industrial #4 Environment #5 Recreation
Steamboat Springs (52 respondents) **	51 Yampa 1 Out of Region	49 Routt 1 Moffat 2 Out of State	19 Agriculture 11 Municipal/Industrial 11 Environment 10 Recreation 1 Energy	Not identified
Craig (43 respondents)	42 Yampa 1 White	40 Moffat 1 Rio Blanco 1 Routt 1 Out of State	25 Agriculture 6 Municipal/Industrial 5 Recreation 5 Environment 2 Energy	#1 Agriculture #2 Environment #3 Municipal/Industrial #4 Energy #5 Recreation
Meeker (48 respondents)	11 Yampa 37 White	3 Moffat 43 Rio Blanco 2 Routt 1 Out of State	40 Agriculture 7 Municipal/Industrial 1 Environment	#1 Agriculture #2 Municipal/Industrial #3 Energy #4 Environment #5 Recreation



Outreach Meeting	"Home Basin"	County Live In	Primary Use of Water	Most Important Use of Water
Browns Park (16 respondents)	16 Green	12 Moffat 4 Out of State	9 Agriculture 5 Municipal/Industrial 2 Environment	#1/2 Tie: Agriculture and Energy #3 Municipal #4 Environment #5 Recreation
Total 267 attended 183 responses**	106 Yampa = 58% 60 White = 33% 16 Green % = 9 1 Out of Region	58 Moffat = 32% 65 Rio Blanco = 36% 52 Routt = 28% 8 Out of State = 4%	110 Agriculture = 60% 33 Municipal/Industrial = 18% 19 Environment = 10% 18 Recreation = 10% 3 Energy = 2%	

** Technical Problems at Steamboat Springs: only 59% (52 actual count) of the 88 respondents' data was stored

4.1.3 Surveys

The public outreach included a survey regarding consumptive IPPs and one regarding environmental and recreational IPPs. The purpose of the surveys was to gather details on existing or proposed IPPs not previously identified in the SWSI or P&M Study. The surveys were developed with input from the YWG BIP Committee to refine the questions and make them more targeted. The surveys were distributed on April 14, 2014 to Committee members and YWG BRT members, who were given an opportunity to fill them out and distribute it to other stakeholders as they saw fit. The surveys resulted in 3 new IPPs for consumptive use projects and 17 additional IPPs for environmental and recreational projects. These IPPs, and others, are discussed in further detail in Section 4.2.

4.1.4 Stakeholder Collaboration

The YWG Public Education, Participation and Outreach (PEPO) Workgroup and Community Agriculture Alliance engaged the Colorado State University Extension Offices in Routt and Rio Blanco Counties and the conservation districts in Routt, Moffat and Rio Blanco Counties as advertising liaisons. Each of these groups has working relationships with various water users in their counties and was willing to encourage people to attend a meetings, learn about the YWG BIP and respond with written comments to the YWG BRT. The Community Agricultural Alliance worked with the conservation districts to contact their constituencies and provide input to the process.

4.2 WATERSHED HEALTH

Overview of Watershed Health in the Yampa, White, and Green Basins

Watershed health is influenced by both natural processes and human activities and is important for drinking water, agriculture, recreation, and ecological integrity.¹ As water moves through a watershed the surface and sub-surface conditions affect the quality of the water. Water quality refers to the chemical, physical and biological characteristics of water. It is a measure of the condition of water relative to the requirements of aquatic and human need or purpose. The YWG Basin is largely comprised of headwater tributary streams that support relatively high water quality, but are not without impairments to watershed health. Water quality is vitally important to local and regional economies in the YWG Basin. The dominant employment industries in the Basin are: construction (15% of total jobs); education, health and social services (15%); arts, entertainment, recreation, lodging and food services (13%); retail trade (12%); and agriculture, forestry, hunting and mining (10%).² The last three industries in that list account for 35% of total jobs in the YWG Basin, meaning that over one-third of the jobs in the YWG Basin are dependent on water quality that supports tourism, recreation, and agriculture.

¹ (Brown 2014)

² [US](#) Census 2012)



In most subbasins within the YWG Basin, many government (USFS, USFWS, Bureau of Reclamation, National Park Service, Colorado Parks & Wildlife, municipalities, and Water Conservancy Districts), and non-government organizations (The Nature Conservancy, Trout Unlimited, Colorado Water Trust, local grassroots organizations) work both individually and collaboratively to actively support efforts that protect and improve water quality and watershed health. The Upper Yampa River Watershed Group (UYRWG) represents a collaboration to protect and enhance the health of the Upper Yampa River Watershed from the headwaters of the Yampa River to the confluence of and including Elkhead Creek. The [2014 State of the Watershed Report](#) is the first step in the local watershed planning process and serves to document existing conditions. There are other examples of watershed protection efforts on agricultural lands (riparian fencing and riparian habitat protection), within municipalities (water body setbacks and floodplain regulations), stormwater management programs, and more. Many efforts and partnerships are built upon the simple concept that water quality and water quantity must be considered holistically in order to maintain a balance between properly functioning river systems and successful water supply projects. All future proponents of IPPs will be encouraged to work with the respective organizations to develop comprehensive components that consider all of these important aspects of watershed health.

The Colorado Department of Public Health and Environment's (CDPHE) narrative standards describe goals and numeric standards set maximum acceptable concentrations of specific pollutants. Many constituents that are issues of concern for aquatic life, human health or suitability of water for various uses include those on the CDPHE [Regulation 93](#) 2012 303(d) list (303(d) list) of impaired waters or the Monitoring & Evaluation (M&E) List. Impaired waters remain listed until sufficient monitoring shows the stream is no longer impaired. Eighteen stream segments are on the 303(d) list for sediment, metals (iron, copper, and selenium), aquatic life, pH, and E. coli. There are twenty-five segments on the M&E List for metals (lead, mercury, iron, copper, selenium, zinc, and manganese), dissolved oxygen, sediment, E. coli, aquatic life, pH, and temperature (CDPHE Regulation 93. March 2012). The US Geological Survey (USGS) has produced reports that analyze water quality data in many of the river subbasins located within the YWG Basin:

- USGS, Water-Quality Assessment and Macroinvertebrate Data for the Upper Yampa River Watershed, Colorado, 1975 through 2009 [USGS Scientific Investigations Report 2012-5214](#)
- Characterization and Data-Gap Analysis of Surface-Water Quality in the Piceance Study Area, Western Colorado, 1959–2009 [USGS Investigations Report 2013–5015](#)
- USGS, Baseline characterization of water quality and mass loading in Piceance Creek, Rio Blanco County, Colorado, December 2000 [USGS Water-Resources Investigations Report: 2002-4134](#)
- [Comparison of 2011–12 water years and historical water-quality data, White River Basin, Colorado](#)
- Specific Conductance and Dissolved-Solids Characteristics for the Green River and Muddy Creek, Wyoming, Water Years 1999–2008 [USGS Scientific Investigations Report 2009–5168](#)

There are six locations as part of the [Yampa River Basin Monitoring Program](#) (Program) that the USGS monitors each year as of 2010 that will be used to define baseline conditions. Partners sponsoring the Program and the UYRWG will help determine if and where additional monitoring sites are needed. The USGS is conducting water quality baseline monitoring in the [White River Basin](#). [Lower Yampa](#) sediment monitoring through USGS Grand Canyon Monitoring and Research Center is also ongoing in and above Dinosaur National Monument as well as on the Green River above [Gates of Lodore](#). USGS also performs water quality monitoring for the [lower Yampa Basin](#) below Craig, Colorado, to the border with Utah. Further water quality sampling and monitoring occurs in the YWG Basin through various other agencies.

Soil disturbance activities are among the primary sources of sedimentation in the Yampa Basin. These activities include channel modifications, impoundments, and bank degradation which can stem from many different land use activities and natural occurrences. (Wildfires also impact sedimentation. This is discussed in further detail in the next subsection.) Several USGS products have been released regarding sedimentation on the lower Yampa and Green



River basins; Characterization of Hydrodynamic and Sediment Conditions in the Lower Yampa River at Deerlodge Park, East Entrance to Dinosaur National Monument, Northwest Colorado, 2011 [Scientific Investigations Map: 3273](#)³ and Summary of Sediment Data from the Yampa River and Upper Green River Basins, Colorado and Utah, 1993–2002 [Scientific Investigations Report 2004–5242](#)⁴.

Updated and informed reservoir and flow management is critical to sustaining aquatic life and ecosystem function while balancing consumptive demands. A [PBO](#) is performed by the USFWS and is a consultation process with other federal agencies to avoid jeopardizing listed species. These consultations are under Section 7 of the [Endangered Species Act](#) of 1973. Agencies also consult to avoid harming critical habitat. Whenever possible, programmatic consultations address multiple (typically small) projects and require that applicants take specific steps to protect endangered species.

A [PBO](#) is also performed by the USFWS and occurs when another federal agency asks USFWS to concur that their project will not jeopardize the species. After formal consultation, a [PBO](#) is written which determines whether a listed species will be jeopardized or critical habitat adversely modified. It is the basis for actions that need to be taken to minimize impact to the species. As part of the [Upper Colorado River Endangered Fish Recovery Program](#) effort, the USFWS have submitted both types of opinions regarding river operations:

- Green River: Bureau of Reclamation, [Record of Decision Operation of Flaming Gorge Dam Final Environmental Impact Statement](#), February 2006
- Green River: US Fish & Wildlife Service, [Operation of Flaming Gorge Dam Final Environmental Impact Statement, Final Biological Opinion](#), September 2005
- Yampa River: US Fish & Wildlife Service, [Final Programmatic Biological Opinion on the Management Plan for Endangered Fishes in the Yampa River Basin](#), January 2005
- White River: US Fish & Wildlife Service, [COLORADO RIVER RECOVERY PROGRAM Project #:168 FY 13-15 SCOPE OF WORK for White River Management Plan](#), August 2013
- White River: Information on the forthcoming [USFWS Programmatic Biological Opinion for the White River](#) accessed July 9, 2014

Though the above planning documents focus primarily on federally endangered fish, there are numerous aquatic and terrestrial species that depend on the YWG Basin for habitat and require attention when planning for projects. Information on State threatened and endangered species can be found on the [Colorado Parks and Wildlife website](#), and information on the status of federally threatened and endangered species is available on the [USFWS website](#).

Several other studies on water quality in the YWG Basin are available online. Table 4-3 lists these studies and their web addresses.

Table 4-3 Water Quality Studies of the YWG Basin

Study Name	Web Address
Colorado Department of Public Health and Environment Water Quality Control Commission, Regulation 93, March 2012	https://www.colorado.gov/pacific/sites/default/files/Regulation-93.pdf
US Geological Survey WaterSMART—The Colorado River Basin Focus-Area Study Fact Sheet 2012-3114, September 2012	http://pubs.usgs.gov/fs/2012/3114/
Routt & Moffat Counties, Yampa River Watershed 208 Plan, 2002	http://routtcountycd.com/wp-content/uploads/2012/04/208-Plan-Final.pdf

³ (USGS 2011)

⁴ (USGS 2004)



Study Name	Web Address
USGS, Water-Quality Assessment and Macroinvertebrate Data for the Upper Yampa River Watershed, Colorado, 1975 through 2009; USGS Scientific Investigations Report 2012-5214	http://pubs.usgs.gov/sir/2012/5214/
Characterization and Data-Gap Analysis of Surface-Water Quality in the Piceance Study Area, Western Colorado, 1959–2009; USGS Scientific Investigations Report 2013–5015	http://pubs.usgs.gov/sir/2013/5015/
Brown, Jackie. Routt County Conservation District, Upper Yampa River Watershed Group. State of the Upper Yampa River Watershed Report, August 2014	www.routtcountycd.com/Watershed
USGS, Baseline characterization of water quality and mass loading in Piceance Creek, Rio Blanco County, Colorado, December 2000; USGS Water-Resources Investigations Report: 2002-4134	http://pubs.er.usgs.gov/publication/wri024134
Comparison of 2011–12 water years and historical water-quality data, White River Basin, Colorado	http://co.water.usgs.gov/infodata/white_summaries/index.html
Specific Conductance and Dissolved-Solids Characteristics for the Green River and Muddy Creek, Wyoming, Water Years 1999–2008; U.S. Geological Survey Scientific Investigations Report 2009–5168	http://pubs.usgs.gov/sir/2009/5168/
USGS, Characterization of Hydrodynamic and Sediment Conditions in the Lower Yampa River at Deerlodge Park, East Entrance to Dinosaur National Monument, Northwest Colorado, 2011; Scientific Investigations Map: 3273	http://pubs.usgs.gov/sim/3273/
USGS, Summary of Sediment Data from the Yampa River and Upper Green River Basins, Colorado and Utah, 1993–2002. Scientific Investigations Report 2004–5242	http://pubs.usgs.gov/sir/2004/5242/pdf/SIR2004-5242.pdf
Bureau of Reclamation, Record of Decision Operation of Flaming Gorge Dam Final Environmental Impact Statement, February 2006	https://www.usbr.gov/uc/envdocs/rod/fgFEIS/final-ROD-15feb06.pdf
US Fish & Wildlife Service, Operation of Flaming Gorge Dam Final Environmental Impact Statement, Final Biological Opinion, September 2005	http://www.riversimulator.org/Resources/USFWS/BOflamingGorge2005.pdf
US Fish & Wildlife Service, Final Programmatic Biological Opinion on the Management Plan for Endangered Fishes in the Yampa River Basin, January 2005	http://www.riversimulator.org/Resources/USFWS/BOyampa.pdf
US Fish & Wildlife Service, COLORADO RIVER RECOVERY PROGRAM Project #:168 FY 13-15 SCOPE OF WORK for White River Management Plan, August 2013	http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/sow/14-15/isf/168.pdf
Information on the forthcoming USFWS Programmatic Biological Opinion for the White River accessed July 9, 2014	http://www.onthecolorado.org/articles.cfm?mode=detail&id=1383319405772
USGS Colorado Water Science Center, Comparison of 2011-12 water years and historical water-quality data, Yampa River Basin, Colorado	http://co.water.usgs.gov/infodata/yampa_summaries/
USGS Colorado Water Science Center, Comparison of 2011-12 water years and historical water-quality data, White River Basin, Colorado	http://co.water.usgs.gov/infodata/white_summaries/index.html
USGS Grand Canyon Monitoring Research Center, Green River above Gates of Lodore, Colorado	http://co.water.usgs.gov/infodata/white_summaries/index.html
USGS Colorado Water Science Center, Comparison of 2011-12 water years and historical water-quality data, White River Basin, Colorado, Sampling locations by Station number and Station name in lower Yampa Basin	http://co.water.usgs.gov/infodata/yampa_summaries/html/Sites.html



4.3 FOREST HEALTH AND WILDFIRES

Forest health is integral to water quality, and many population centers in the YWG Basin are vulnerable to water quality issues caused by severe wildfires. High intensity wildfires increase the potential for soil erosion and sedimentation by removing vegetation that anchors the soil and slows runoff and rainwater, and by causing soil to become hydrophobic. The loss of vegetation and creation of hydrophobic soils creates prime conditions for erosion, landslides, and mudflows in post-wildfire areas. Sediment, soil, and mud infiltrate water supplies in post-burn areas, decreasing water quality and water storage.

Although Colorado's most severe wildfires have primarily occurred along the Front Range, the YWG Basin is susceptible to large wildfire incidents. In fact, Northwest Colorado, and Moffat County is particular, is the second most likely place in the nation for fires caused by lightning strikes⁵. BLM monitoring systems show that thousands of lightning strikes can happen during a single thunderstorm in the County. Most of these strikes do not evolve into wildland fire starts, but the potential for a large wildland fire to occur is still a major concern. The Moffat County Wildfire and Fuels Management Plan was developed between 2001 and 2003 to address this risk, identify wildfire suppression priority zones in the County, and recommend wildfire mitigation activities. The Routt County Community Wildfire Protection Plan identified three large wildfires including the Mt. Zirkel Complex in 2002 (approximately 30,000 acres burned), Green Creek Fire (4,400 acres), and the Lost Lakes Fire Use (5,536 acres).⁶ Other major fires in the Basin include the Big Fish Fire of 2002, which burned 17,000 acres in the Flat Tops Wilderness Area roughly 34 miles southwest of Steamboat Springs. The 2012 Rio Blanco County Community Wildfire Protection Plan listed 17 fires over 1,000 acres in size between 1993 and 2011. The occurrence of another severe wildfire in the YWG Basin is generally considered to be a matter of "when," not "if."

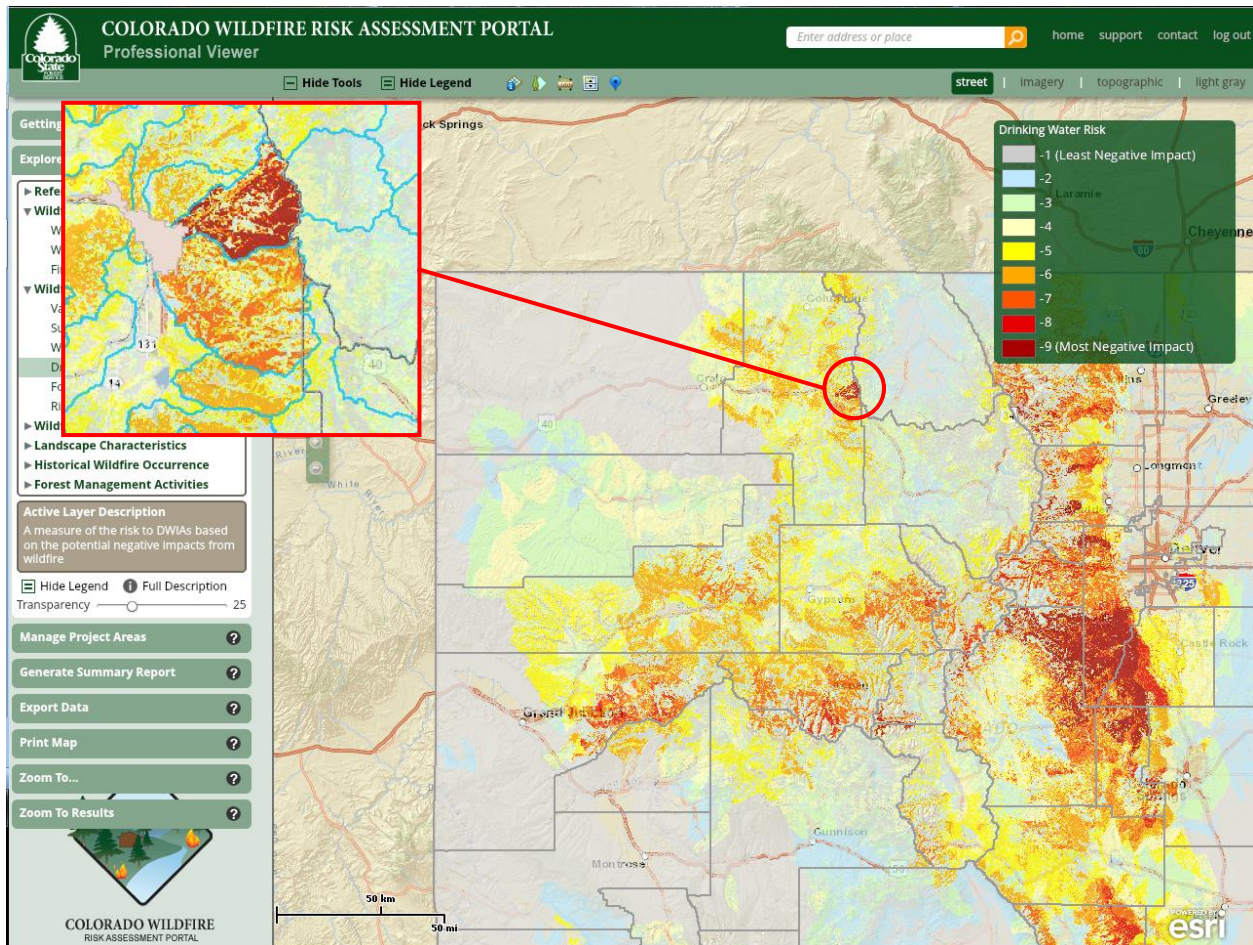
Several communities in the YWG Basin are dependent on forest water supply, as noted in each county's Community Wildfire Protection Plan. Landowners in the YWG Basin have noted that major wildfires in the area have caused erosion issues, sedimentation, landslides, and water quality chemistry issues during spring runoff and following rainstorms. The City of Steamboat Springs is particularly at risk for wildfire impacts to drinking water. The Steamboat Springs surface water supply comes from Fish Creek and Fish Creek Reservoir, both of which are supplied by runoff from forested lands. Fish Creek is one of the higher risk areas for wildfire-water quality issues, as illustrated in Figure 4-2 and Figure 4-3 from the Colorado Wildfire Risk Assessment Portal⁷. These figures show that the Fish Creek watershed is ranked highest in the Yampa Basin for both drinking water importance areas and drinking water risk. To mitigate this risk, Steamboat Springs is trying to secure additional water sources, such as alluvial wells on the Yampa River. The Town of Yampa has an underground infiltration gallery, and thus wouldn't be as affected by erosion and sedimentation issues caused by wildfires. The Town also has the option to pump out of the Yampa River if needed. The City of Craig also has less wildfire-water quality risk compared to Steamboat Springs given that there is less wildfire fuel in the vicinity. However, because of the sedimentary soils in the area, Craig could still potentially

⁵ (Hamilton 2012)

⁶ (Routt 2010)

⁷ (CO-WRAP 2014)

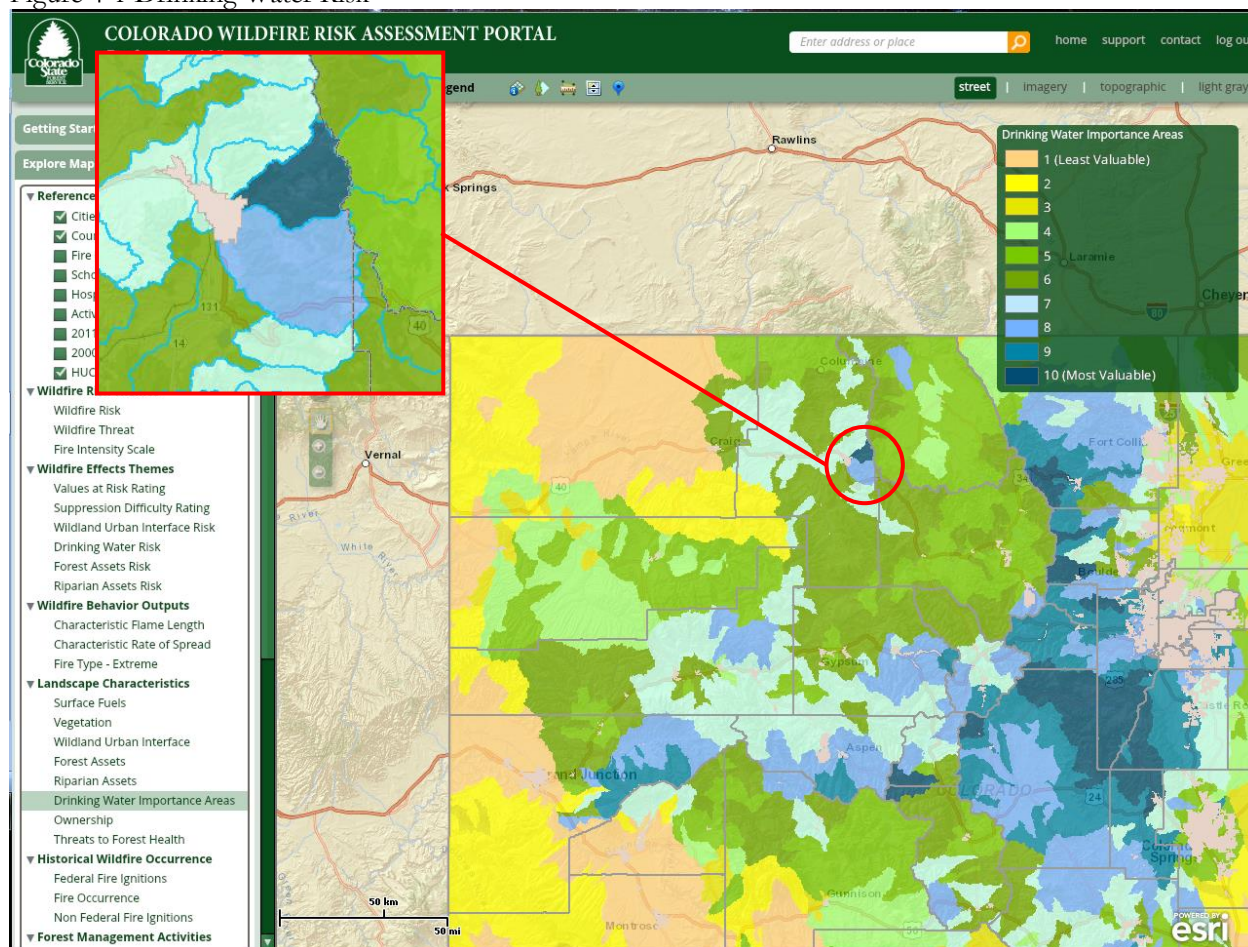




Source: Colorado Wildfire Risk Assessment Portal 2014



Figure 4-1 Drinking Water Risk



Source: Colorado Wildfire Risk Assessment Portal 2014

Figure 4-2 Drinking Water Importance Areas

Source Water Protection Plans

Since roughly 2009, Colorado communities have been encouraged to develop Critical Community Watershed Wildfire Protection Plans (CCWWPPs) as part of Source Water Protection Plans (SWPPs). The CCWWPPs resemble CWPPs but focus on watershed protection rather than on the wild land urban interface (WUI). Projects from CWPPs may be located in watersheds though, and those projects should be incorporated into the CCWWPPs. Representatives from local fire protection districts, USFS, Colorado State Forest Service (CSFS), Bureau of Land Management (BLM), and other wildfire mitigation stakeholders should be included in source water and watershed protection planning efforts⁸.

JW Associates, Inc. completed a report in 2010 titled “Upper Yampa Phase 1 Watershed Assessment: Prioritization of watershed-based hazards to water supplies.”⁹ This report follows the CCWWPP model, examining post-wildfire hazards in watersheds including flooding, debris flow, and increased sediment yields. The report generated a composite hazard ranking of the Upper Yampa watersheds based on three components: wildfire hazard, flooding/debris flow hazard, and soil erodability. The results of the composite hazard ranking indicated that the

⁸ More information on the CCWWPP initiative can be found on www.colorado.gov by searching for “Critical Community Watershed Wildfire Protection Plans.”

⁹ (USFS 2010)



highest ranked sixth-level watersheds include outlet of Mad Creek, Middle Fork Elk River, Upper Trout Creek, Bunker Creek, headwaters of Oak Creek, and Harrison Creek. The Phase 1 report does not make specific recommendations for protecting watershed health in relation to the impacts from wildfires.

Moffat, Rio Blanco, and Routt¹⁰ counties all have county-level CWPPs. All three plans identify watersheds as critical assets in their planning areas and note the importance of protecting watershed quality as part of wildfire mitigation. Watershed protection is taken into account for each CWPP's mitigation projects.

The Routt County CWPP identifies “maintaining healthy watersheds” as one of its primary goals. The Routt County CWPP specifically identifies several municipal watersheds within the CWPP planning area. Surface water and wells provide the water supply for the majority of these communities. The need to protect watersheds is stated several times throughout this CWPP. The Moffat County CWPP evaluates potential watershed issues in Appendix F Fuel Reduction Project Plans. None of the proposed wildfire mitigation projects in the plan were found to threaten a water source.

Although wildfire mitigation is necessary to help reduce the likelihood of a severe wildfire occurring, the mitigation activities themselves can be a source of water contamination. Mechanical treatments that involve disturbing the soil can increase sediment loads in surface waters. Herbicide treatments can cause water contamination.¹¹ Methods for mitigating water contamination from wildfire mitigation activities include installing erosion control devices around source water intakes during wildfire mitigation projects. Communities should work with the BLM, USFS, CSFS, Natural Resources Conservation Service (NRCS), and conservation districts to protect water sources while undertaking wildfire mitigation projects.

4.4 M&I, SSI, AGRICULTURE AND MULTI-PURPOSE IPPS

The YWG BRT is developing a collection of IPPs through the YWG BIP planning effort. These IPPs consist of projects previously identified through SWSI and the P&M Study in addition to new projects identified through the surveys distributed to the YWG BRT in April of 2014. These surveys were distributed as a component of the BIP planning effort, asking the YWG BRT members and other stakeholders within the Basin to provide information on M&I, SSI, and/or agricultural projects that have previously not been identified as IPPs.

Table 4-4 provides a summary of these IPPs while Figure 4-3 shows the locations. The IPPs are categorized by whether or not they were modeled in the P&M Study. The ten IPPs that were modeled in the P&M Study are denoted with black crosses and contained the following elements:

- Project Proponent
- Location
- Physical Characteristics
- Operations
- Water Rights – Either conditional water rights, or an undecreed water right, is assumed as a proxy

IPPs that did not contain these elements were not modeled in the P&M Study and are identified in Figure 4-3 with red crosses. It is important to note that while these projects are the currently foreseeable IPPs, Table 4-4 is not an inclusive list. The table may be modified to include additional new IPPs as regional and local planning efforts continue throughout the YWG Basin. To accommodate this potential change, placeholders have been added at the end of the list, e.g., water conservation efforts by additional municipal water providers and other generic IPPs to meet future needs. Current planning processes also have not identified all of the IPPs necessary to address all of the

¹⁰ (Moffat 2004), (Rio Blanco 2012), and (Routt 2010), respectively

¹¹ (Garfield 2012)



consumptive shortages presented in Chapters 2 and 3. As recommended in Chapter 5, additional analysis and follow-up studies will provide the YWG Basin a better picture of how various IPPs can be used to meet shortages to both consumptive and environmental/recreational needs. As planning efforts continue, the YWG BRT will explore how projects and processes can provide multi-purpose benefits, an approach that is advantageous for all interests and is a goal of SWSI and the IBCC. These opportunities will be further refined as projects are carried through the permitting phase. To highlight this approach, Table 4-4 denotes IPPs that may include benefits to other sectors that are not currently identified.



Table 4-4 Summary of Current M&I, SSI, Agriculture and Multi-Purpose IPPs

Map ID	Name of Project	Project Location	M&I	SSI	Ag	Env/ Rec	Modeled/ Not Modeled	Primary Purpose of Project	Project Status	Projected Completion	Proponents	Storage Right	Project Yield	Project Capacity	Project Cost	Funding Sources	Challenges
1	Elkhead Reservoir Enlargement Project						Not Modeled				Colorado River Water Conservation District		4,300 AF				
2	Fish Creek direct flow and storage	Fish Creek Drainage in Buffalo Pass area	X				Not Modeled	Releases from Long Lake (396 AF) and Fish Creek Reservoirs (4167 AF) are used to augment native flows when they fall below 7 cfs; MWW & City hold the most senior pre- compact rights 8.3 cfs. Future M&I needs	Existing infrastructure	DNA	Mt. Werner Water / City of Steamboat Springs						
3	Lake Avery Enlargement ⁶	Expansion to Big Beaver Reservoir (Avery Lake)		X			Modeled	The only operation for the Lake Avery Enlargement is making direct releases to meet oil shale production demands.				The purpose of the Scenario 2 and 3 models of the Energy Development Water Needs Assessment were to reliably meet oil shale production demands with rights junior to all other diversions in the basin. That methodology was also used in the P&M Study. Therefore it is modeled with an undecreed water right. --The Lake Avery Enlargement is filled both by a pipeline diverting water from the White River upstream of Big Beaver Creek and a direct storage right on Big Beaver Creek.	48,274 AF + 7,658 AF (original capacity of Big Beaver Res)				
4	Little Bear 1 Reservoir ¹	Fortification Creek Basin			X	Possible secondary benefit	Modeled	Releases are made to three aggregate diversions (WDID 440511, 440612, and 440688), which were identified as the three diversions to which Little Bear				No conditional storage rights, junior right assumed		800 AF			



Map ID	Name of Project	Project Location	M&I	SSI	Ag	Env/ Rec	Modeled/ Not Modeled	Primary Purpose of Project	Project Status	Projected Completion	Proponents	Storage Right	Project Yield	Project Capacity	Project Cost	Funding Sources	Challenges
								I Reservoir could release water as described in the Agricultural Water Needs Study.									
5	Milk Creek Reservoir ³	Milk Creek Reservoir upstream of the confluence with the Yampa River		X	X	Possible secondary benefit	Modeled	Similar to Rampart Reservoir, Milk Creek Reservoir cannot release to any water short diversions on upper Milk Creek; however, releases are made to the Yampa River oxbows diversion. Milk Creek Reservoir also exchanges to all diversions upstream on Milk Creek if exchange capacity exists on the creek. No operations were defined for the industrial storage account				An existing conditional water right with a 1976 date of decree of 70,000 AF; however, this is only for industrial beneficial uses. At the request of the BRT subcommittee, Milk Creek Reservoir was modeled for agricultural and industrial uses. For the P&M Study, this conditional right maintained its 1976 water right date, but the industrial storage was reduced to 35,000 AF. --The remaining 35,000 AF of storage is filled using an undecreed water right for agricultural uses.		70,000 AF			
6a 6b 6c	Lower White River Storage Project	Possible off-channel storage sites near the White River: -Wolf Creek -Spring Creek -Gilliam	X	X	X	X	Modeled with junior water rights	Water Storage, M&I, Recreation, Supplemental Flows, Energy, Augmentation	Ongoing Feasibility Study	To be defined in Feasibility Study	Town of Rangely, Rio Blanco County, Colorado River Water Conservation District (potentially), CWCB (potentially), USFWS (potentially), Energy Companies (potentially)		To be defined in the Feasibility Report		To be defined in the Feasibility Report	Rio Blanco Water Conservancy District revenues and mill levy, CWCB, Town of Rangely, Rio Blanco County, USFWS, Colorado Parks and Wildlife, Colorado Water Resources and Power Development Authority, Various Energy Companies (Sources to be determined in Phase II of the Feasibility Study)	Developing a viable financing plan and completing Federal NEPA documentation will be challenging, but are not considered to be insurmountable
7	Monument Butte Reservoir ¹	Morapos Creek Basin			X	Possible secondary benefit	Modeled	Releases are made to four aggregate diversions (WDID				No conditional storage rights, junior right		4,390 AF			



Map ID	Name of Project	Project Location	M&I	SSI	Ag	Env/ Rec	Modeled/ Not Modeled	Primary Purpose of Project	Project Status	Projected Completion	Proponents	Storage Right	Project Yield	Project Capacity	Project Cost	Funding Sources	Challenges
								440590, 440651, 440814, and aggregate diversion 44_ADY016A), which were identified as the diversions to which Monument Butte Reservoir could release water to as described in the Agricultural Water Needs Study.				assumed					
8	Morrison Creek Project ⁴	Morrison Creek	X	X	X	X	Modeled ⁷ (turned on)	Firming Stagecoach Reservoir			Upper Yampa Water Conservancy District	There are two storage rights for Morrison Creek Reservoir, a first fill and a second fill. The first fill right has a 4,965 AF conditional water right (administration number = 41272.39991) and the second fill has a 5,655 AF conditional water right (administration number = 57676.00000).	Approximately 3,000 to 5,000 AF				
9	Oil Shale Production Pipelines/Diversions (new diversions) ⁶	White		X			Modeled										
10	Peabody-Trout Creek Reservoir ²	Trout Creek upstream of the confluence with the Yampa River		X	Possible secondary benefit	Possible secondary benefit	Modeled	The sole purpose of the Peabody-Trout Creek Reservoir is to meet the 6,000 AFY energy development demands (which do not have a direct diversion water right) that are also part of the Peabody-Trout Creek Project				A first fill water right with administration number 43575.00000 and conditional storage of 15,000 AF		11,720 AF			
11	Rampart Reservoir ¹	Lower Fortification Creek upstream of Wisconsin Ditch			X	Possible secondary benefit	Modeled	Since Rampart Reservoir is only located upstream of two potentially short water diversions (the oxbows aggregate diversion and WDID 440511), releases are made to the oxbows aggregate				- A first fill water right with administration number 41126.00000 and conditional storage of 12,133 AF -A second fill water right with administration number		12,133 AF			



Map ID	Name of Project	Project Location	M&I	SSI	Ag	Env/ Rec	Modeled/ Not Modeled	Primary Purpose of Project	Project Status	Projected Completion	Proponents	Storage Right	Project Yield	Project Capacity	Project Cost	Funding Sources	Challenges
								diversion and WDID 440511. The second set of operations for Rampart Reservoir is to exchange water upstream to South Fork II and Little Bear I. The last set of operations for Rampart Reservoir is to exchange water upstream to each individual diversion on Fortification Creek				47905.00000 and conditional storage of 11,692 AF					
12	South Fork II Reservoir ¹	Fortification Creek Basin			X	Possible secondary benefit	Modeled	Releases are made to seven aggregate diversions (WDID 440511, 440612, 440647, 440650, 440681, 440688 and 440998), which were identified as the seven diversions to which South Fork II Reservoir could release water as described in the Agricultural Water Needs Study.				No conditional storage rights, junior right assumed		1,700 AF			
13	Upper Morrison Diversion	Section 14, Township 3N, Range 84W	X	X	Possible secondary benefit	Possible secondary benefit	Modeled ⁷ (turned off)	Firming of Stagecoach Reservoir (part of Morrison Creek Reservoir (IPP #8) as an alternate point of diversion)			Upper Yampa Water Conservancy District		Approximately 5,000 to 10,000 AF	50 cfs diversion water rights with a 15 cfs bypass requirement (Case 01CW0041 App. Date 12-30-1994)			
14	Steamboat Springs Conservation	Steamboat area water provider districts	X				Not Modeled	Program to realize a 15% passive conservation savings over time equal to 800 AF by 2035 by implementing measures such as leak detection programs, fixture rebate programs, and reducing landscape irrigation needs.	On-going		Steamboat Springs		720 AF			CWCB, Area Water Providers	
15	Wolf Creek Reservoir ⁶	White River downstream of the confluence with		X			Modeled	Water from Wolf Creek Reservoir is				The purpose of the Scenario 2 and 3		162,400 AF			



Map ID	Name of Project	Project Location	M&I	SSI	Ag	Env/ Rec	Modeled/ Not Modeled	Primary Purpose of Project	Project Status	Projected Completion	Proponents	Storage Right	Project Yield	Project Capacity	Project Cost	Funding Sources	Challenges
		Piceance Creek						transported upstream via carrier to directly meet oil shale production demands.				models of the Energy Development Water Needs Assessment were to reliably meet oil shale production demands with rights junior to all other diversions in the basin. That methodology was also used in the P&M Study; therefore, it is modeled with a 2013 water right. --The only water right Wolf Creek Reservoir uses to store water is an undecreed water right on the White River					
16	Rangely Raw/Irrigation	White River			X	X	Not Modeled	Agriculture and Recreation	Planning/feasibility	Study to begin May 2014	Colorado Northwest Community College, Rio Blanco Water Conservancy District, Town of Rangely, Western Rio Blanco Metropolitan Recreation District.		250 AF				
17	Morrison Creek District Yampa River Water Treatment Plant	Yampa River just upstream of Stagecoach Reservoir	X				Not Modeled	Municipal water supply for Stagecoach development	Planned	Unknown			9 cfs		unknown		Need for project dependent on growth in Stagecoach which is a designated growth area in Routt County
18	Elk River Project	On the east bank of the Elk River on the SE1/4 of the SW1/4 of Section 22, Township 7North, Range 85 West of the 6 th P.M., Routt County, Colorado.	X				Not Modeled	Future M&I needs and redundant supply in the event of supply interruption or wildfire.	Conceptual		Steamboat Springs		3,000 AF	Reservoir capacity TBD		TBD	
19	Expansion of Yampa River Wells	On both sides of Yampa River south of Steamboat Springs in vicinity of Dougherty Rd and US 40	X				Not Modeled	Expand Yampa River Wells from 1.8 MGD to 3.5 MGD to: -provide for future M&I needs -provide redundancy in case of wildfire above	Developing hydrologic model		City of Steamboat Springs Mt. Werner Water and Sanitation District		Current operating yield = 500 AF during 90-day seasonal operation	Year round operation at current sustainable 1.8 MGD capacity = up to 2016 AFY Year		City of Steamboat Springs Mt. Werner Water and Sanitation District	



Map ID	Name of Project	Project Location	M&I	SSI	Ag	Env/ Rec	Modeled/ Not Modeled	Primary Purpose of Project	Project Status	Projected Completion	Proponents	Storage Right	Project Yield	Project Capacity	Project Cost	Funding Sources	Challenges
								WTP on Fish Creek, i.e., production can be moved to Fish Creek wells						round operation at expanded 3.5 MGD capacity = up to 3930 AFY all depending on fall and winter yields			
20a 20b 20c 20d 20e 20f 20g 20h	Yellow Jacket Water Conservancy District Reservoir Feasibility Study	White River and drainages; possible sites include: -Lost Park -Mahogany -Ripple Creek -Sawmill Mountain -Strawberry Creek -Thornburgh -Tom Little Gulch -Wray Gulch	X	X	X	X	Modeled with junior water rights	M&I, agriculture, recreation, environmental, other beneficial uses	Study completed								
	Colorado River Compact Water Bank	Colorado River Basin				X	Not Modeled	1. Prevent curtailment 2. Protect certain critical post- compact (i.e. junior) uses in the event of curtailment.	Feasibility study in progress	2007	Southwestern Water Conservation District, The Nature Conservancy, Front Range Water Council, State of Colorado		N/A			Proponent funding and CWCB ATM grant funding	A large number of technical, legal, economic, and administrative challenges will need to be addressed ultimately
	Other Municipal Water Conservation																
	Other IPPs to Meet Future Needs																

¹Originally identified in the Yampa River Basin Small Reservoir Study - Phase 2 (CRWCD 2000)
²Described in Modeling for the Peabody-Trout Creek Reservoir Supply Project (Peabody 2014)
³Identified by Tri-State Generation & Transmission Association (Chartrand, 2013)
⁴Evaluated in Upper Yampa WCD (UYWCD) Supply Plan Model (UYWCD 2013)
⁵Originally identified in the Steamboat Supply Master Plan (Steamboat 2008); re-evaluated in UYWCD Supply Plan Model
⁶Identified in the Energy Development Water Needs Assessment Phase II report (Colorado, Yampa, White BRT 2011)
-Note that Oil Shale Production Pipelines/Diversions is a conceptual supply system rather than an actual system with physical components. The three elements include:
-White River direct diversion to meet oil shale production demands on Piceance Creek
-White River pipeline used to fill the Lake Avery enlargement
-As part of Wolf Creek Reservoir operations, oil shale production demands are augmented by water delivered via a carrier from Wolf Creek Reservoir
⁷ For purposes of the BIP modeling effort the Morrison Creek Project (#8) is “turned on” while the Upper Morison Diversion (#13) is “turned off.” Both projects are included in the modeling, however, only one of the projects can be “turned on” for a given modeling run.



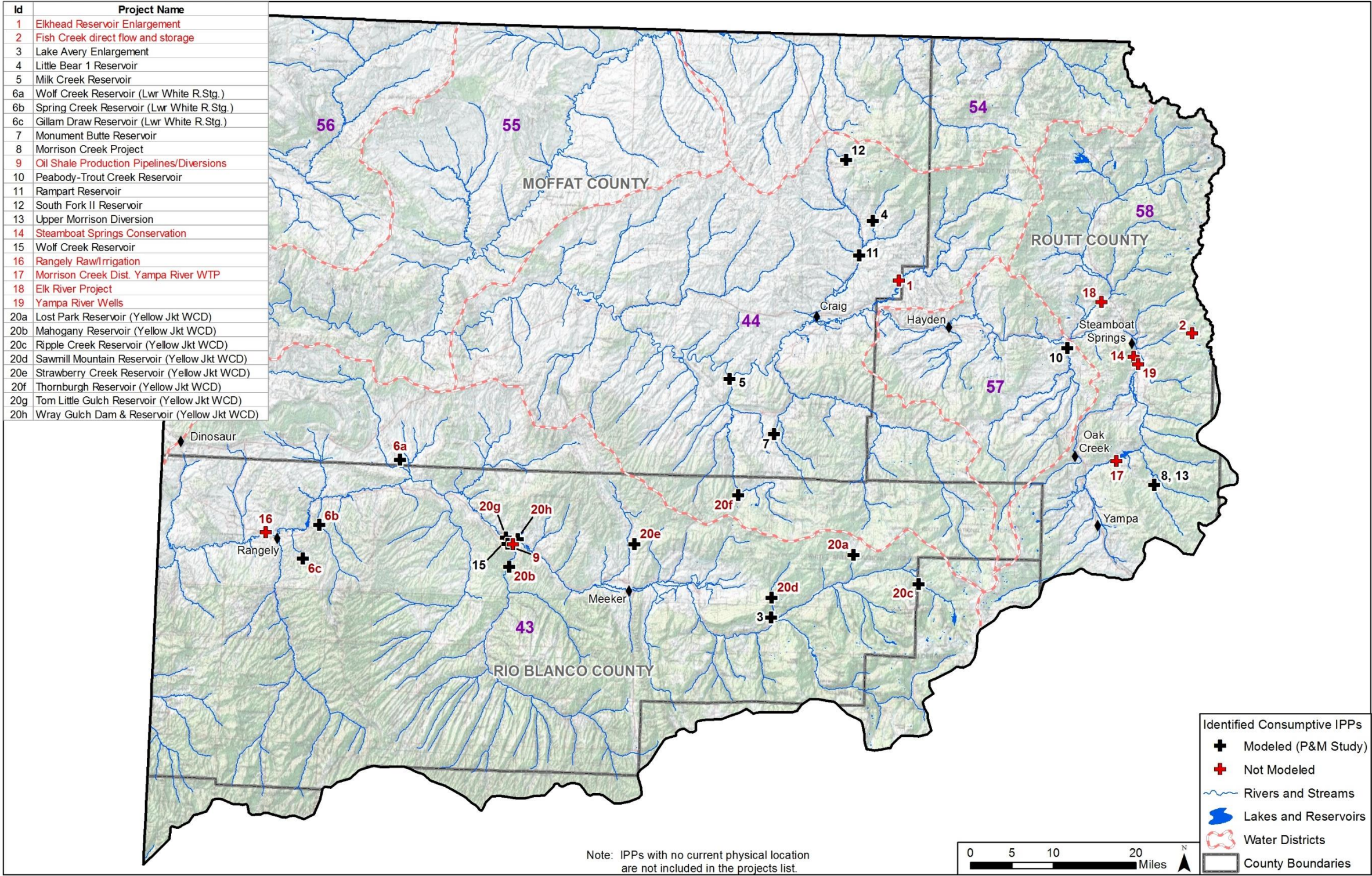


Figure 4-3 Location of M&I, SSI, Agriculture and Multi-Purpose IPPs

4.5 ENVIRONMENTAL AND RECREATIONAL IPPS

The YWG BRT identified a collection of IPPs that exclusively focus on environmental and recreational water needs and benefits. This collection of environmental and recreational IPPs was developed through a survey distributed to the YWG BRT and other stakeholders in the Basin in April and May of 2014.¹² The IPPs are highlighted in Table 4-5 while the locations of the IPPs are shown in Figure 4-4.

The majority of these IPPs are located in the environmental and recreational focus areas discussed in Chapter 2. It is important to note that while these projects are the currently foreseeable IPPs, Table 4-5 is not an inclusive list and does not address all of the environmental and recreational needs and shortages discussed in Chapters 2 and 3. The table will be modified to include additional IPPs as regional and local planning efforts continue throughout the Basin. Future projects will be developed for the existing focus areas, shown in Figure 4-4, as well as in other tributaries who demonstrate a need for environmental and recreational improvements.

¹² The environmental and recreational IPP list previously developed through SWSI and the Nonconsumptive Needs Assessments was not reviewed and approved by the YWG BRT prior to publishing. During the BIP planning process, the YWG BRT decided to develop a new updated IPP list based on input from YWG Basin stakeholders.



Table 4-5 Environmental and Recreational IPPs

ID	Name of Project	Project Location	Study	Monitoring	Instream flow appropriation	Restoration	Species reintroduction	Structure improvement	Habitat restoration	Water quality	Stewardship	Water lease acquisition	Voluntary flow agreements	Management plan	Conservation easement	Non-native species management	Reservoir operations	Biological opinion	RICD	Other	Additional Details	Project Status	Projected Completion	Proponents	Partners	Project Cost	Funding Sources	Challenges
1	Upper Yampa backwater modifications	Initial projects located within Chuck Lewis SWA and within Steamboat Springs on the south end of city limits. However, multiple sites throughout the Upper Yampa River corridor could benefit from alterations of backwater habitats. Benefits to the Upper Colorado Endangered Fish Recovery Program by implementing one element of the program's non-native fish control strategy. Also benefits other environmental attributes of the riverine ecosystem. All other elements of the non-native fish control strategy are part of keeping the Yampa River Basin PBO in place below.	x	x		x		x	x	x	x					x					Stakeholders would develop multi-faceted projects implementing habitat modifications/restoration activities to alleviate unnatural backwater habitats to minimize non-native species recruitment and improve ecological functions of the riverine system. Multiple recreational benefits would be realized as well.	Ongoing	By 2020	CPW and USFWS per table 3a of the non-native fish control strategy.	Potential partners include: City of Steamboat Springs and Ski Corps	\$150,000 - \$750,000 depending on project	Potentially Colorado Parks and Wildlife, City of Steamboat Springs, Endangered Fish Recovery Program, Ski Corps, GOCO	Unknown
2	Loudy Simpson access and recreational river enhancements	Yampa River at Loudy Simpson Park in Craig, Colorado.																		x	Provide improved access to river and restoration/rebuild of riffle for non-consumptive needs specific to increasing recreational opportunities and float boating in the Yampa River at the park.	Ongoing (There is a project being worked on at a preliminary planning stage at the moment).	By 2018	Possible project proponent is Moffat County Tourism Association. Melody Villard, Tourism Director is a good contact: mvillard@moffatcounty.net	Possible partners are the Board of Moffat County Commissioners and the Craig City Council, Friends of the Yampa, American Whitewater	Unknown	YWG Basin Roundtable	Permitting
3	Upper Elkhead Creek Stream Restoration	Stream restoration will occur on approximately 16 miles of Elkhead Creek and its tributaries from the southern end of California Park upstream to the headwaters.		x		x			x	x											Indirect benefits to consumptive uses include a reduction in sediment entering Elkhead Reservoir.	Ongoing (The project began on Armstrong Creek, a tributary of Elkhead Creek, in 2012).	Beyond 2020 (The project is expected to take 15 years).	Forest Service	Trout Unlimited, Routt County Conservation District, and Colorado Parks and Wildlife	4 million dollars	Current funding has been provided by the partners, YWG BRT, CWCB, and several other donors.	Unknown



ID	Name of Project	Project Location	Study	Monitoring	Instream flow appropriation	Restoration	Species reintroduction	Structure improvement	Habitat restoration	Water quality	Stewardship	Water lease acquisition	Voluntary flow agreements	Management plan	Conservation easement	Non-native species management	Reservoir operations	Biological opinion	RICD	Other	Additional Details	Project Status	Projected Completion	Proponents	Partners	Project Cost	Funding Sources	Challenges
4	Implementation of projects that improve instream and riparian habitat, irrigation infrastructure, and/or flows	Upper East Fork Williams Fork sub-basin, from the headwaters to the confluence with Poose Creek (and including Poose Creek)						x	x	x		x										Planned	By 2020	Trout Unlimited	Trout Unlimited, Forest Service	Up to \$500k	Unknown	Unknown
5	Yampa River Structures Project	Downtown Steamboat Springs, Colorado from 9th Street at the foot bridge over the river then downstream to approximately above where Soda Creek enters the Yampa. This reach of river is approximately ¼ of a mile in river length.						x													Objectives: • To enhance/preserve the natural character of the Yampa River in downtown Steamboat Springs through river rehabilitation improvements • Improve upon and create additional recreational boating and fishing opportunities in the Yampa River in downtown Steamboat Springs. • To enhance the value of the River as a community amenity through access points and recreational use opportunities. • Improve public safety by rebuilding the D-Hole which was built with outdated methodology and isn't functioning properly.	Ongoing (Currently finalizing our plans that will be submitted to the Army Corps of Engineers).	By 2015	Friends of the Yampa	City of Steamboat Springs YWG BRT	\$100,000	Friends of the Yampa, City of Steamboat Springs, YWG BRT	Potential for permit denial
6	Planning/restoration on the Yampa River through Morgan Bottom Creek	Yampa River from the Marshall-Roberts headgate to the Town of Hayden. (Morgan Bottom)				x		x													Watershed planning and implementation of riparian restoration, bank and channel restoration and irrigation infrastructure improvement projects through the Morgan Bottom reach. Stakeholders are developing multi- purpose projects that will restore riparian habitat, upgrade irrigation infrastructure and control erosion along this reach of the Yampa River.	Ongoing	Through 2020	The Nature Conservancy	Potential partners include 5 major ditch diverters, Colorado Parks and Wildlife, NRCS, UYRWG, The Nature Conservancy	Partially Funded	Shell, CPW, Packard, UYWCD and other funding pending	



ID	Name of Project	Project Location	Study	Monitoring	Instream flow appropriation	Restoration	Species reintroduction	Structure improvement	Habitat restoration	Water quality	Stewardship	Water lease acquisition	Voluntary flow agreements	Management plan	Conservation easement	Non-native species management	Reservoir operations	Biological opinion	RICD	Other	Additional Details	Project Status	Projected Completion	Proponents	Partners	Project Cost	Funding Sources	Challenges
7	Optimize flow protection and augmentation	Yampa and Little Snake rivers endangered fish flow reaches for the Yampa from Craig to its mouth and for the lower Little Snake to the confluence with the Yampa. Some non-native fish control occurs above these reaches and is not shown in Figure 4-2.	x		x							x				x	x	x			Optimize flow protection and augmentation for endangered fish recovery and other non-consumptive attributes for the same reaches in conjunction with new, in-basin consumptive IPPs and keep the Yampa PBO in place. The depletions and storage assumptions for the Yampa River PBO are out of date and the flow impacts of new, in-basin consumptive IPPs need to be re- assessed. The non-native fish control for this PBO also needs to be updated.	Ongoing	By 2020	The Nature Conservancy, Fish & Wildlife Service	USFWS, CPW, and other Endangered Fish Recovery Program partners. See table 3a of the non-native fish control strategy.	Partially funded	Partners in endangered fish recovery program (partially funded).	Unknown
8	Assess the flow regime for endangered fish recovery	White River from Rio Blanco Lake to the state line	x		x							x				x	x	x			Assess the flow regime for endangered fish recovery in conjunction with new, in-basin consumptive IPPs, protect or augment flows, and control non-native fish, all as needed for a PBO. A PBO is needed to provide certainty for new, in-basin consumptive IPPs and to assist with endangered fish recovery	Ongoing	By 2015	The Nature Conservancy, Fish & Wildlife Service	USFWS, CPW, and other Endangered Fish Recovery Program partners. See table 5a of the non-native fish control strategy.	Funded	Partners in endangered fish recovery program	Unknown
9	Flow protection & augmentation for warm-water fish & cottonwood	These reaches are the same as the endangered fish reaches above for IPP 7 and 8	x		x							x					x				Optimize flow protection augmentation in conjunction with new in-basin consumptive IPPs to reduce flow alteration risks to warm-water fish survival and cottonwood abundance	Proposed	By 2020	The Nature Conservancy	USFWS, CPW, TNC	Not funded	Not funded	Unknown
10	Yampa Preferred Target Flow Through Steamboat Springs	Stagecoach Reservoir to the City of Steamboat Springs' Waste Water Treatment Plant Outfall (including ISF 582164 and RICD)	x						x	x	x	x	x			x	x		x		Supplement flows on the Yampa River through the City for a variety of municipal uses, including, but not limited to, recreation, water quality, enhanced fishery and other purposes. These enhanced flows during low periods will reduce temperature and increase D.O. for other non-consumptive attributes in the same reach. This reach of the Yampa is on the 303D Monitoring and Evaluation List for temperature.	Proposed	Unknown	City of Steamboat Springs	Colorado Water Trust, Upper Yampa Water Conservancy District	Not funded	Currently not funded.	To be determined



			Study	Monitoring	Instream flow appropriation	Restoration	Species reintroduction	Structure improvement	Habitat restoration	Water quality	Stewardship	Water lease acquisition	Voluntary flow agreements	Management plan	Conservation easement	Non-native species management	Reservoir operations	Biological opinion	RICD	Other								
ID	Name of Project	Project Location																			Additional Details	Project Status	Projected Completion	Proponents	Partners	Project Cost	Funding Sources	Challenges
11	Recreational, habitat & management strategy improvements	Yampa River within Steamboat Springs	x			x		x												x	Implement recreational and habitat improvements and management strategies to support ecosystem function as well as recreational needs within the Yampa River stream corridor through Steamboat Springs. Update the Steamboat Springs Yampa River Management Plan and Structures Master Plan as needed. Implementation of the Yampa River Management Plan and Structures Master Plan has been on-going since 2003. Implementation of remaining projects and/or re-evaluation of plans are warranted. Other uses: support recreational access.	On-going	Potentially City of Steamboat Springs, Friends of the Yampa, CPW	Potentially City of Steamboat Springs, Friends of the Yampa, CPW	Potentially City of Steamboat Springs, Friends of the Yampa, CPW	Partially funded	Potentially City of Steamboat Springs, Friends of the Yampa, CPW, GoCo, American Rivers, American Whitewater (partially funded)	Unknown
12	Augment instream flow shortages (Elk). Other instream flow water rights could be augmented wherever they are not fully supplied.	ISF 581355 & 582219	x									x					x				Both of these water rights face shortages and could be augmented by the same upstream supply	Proposed	Potentially CPW and CWT or TU	Potentially CPW and CWT or TU	Potentially CPW and CWT or TU	Not funded	Not currently funded. Potentially CPW and CWT or TU	Unknown
13	Cross Mountain Canyon Ranch - habitat and recreational improvements	Yampa River at Cross Mountain Canyon Ranch				x			x		x									x	BLM's 2013 acquisition of the Cross Mountain Canyon Ranch includes 2.5 miles of riverside property where river access is proposed. The BLM is now the property's long-term conservation steward and will look to install visitor facilities on the property among other maintenance and improvement work for recreational and habitat needs.	On-going	Unknown	BLM	Possibly Colorado Parks and Wildlife, Friends of the Yampa			
14	Sarvis Creek habitat and recreational access improvements	Yampa River below Sarvis Creek confluence						x	x		x									x	Establish new public fishing access and habitat improvements within and along a prime 1/8th of a mile stretch of the Yampa River.	On-going		Western Rivers Conservancy	BLM, Forest Service, Colorado Parks and Wildlife, Yampa River Stream Improvement Charitable Trust, Friends			



ID	Name of Project	Project Location	Study	Monitoring	Instream flow appropriation	Restoration	Species reintroduction	Structure improvement	Habitat restoration	Water quality	Stewardship	Water lease acquisition	Voluntary flow agreements	Management plan	Conservation easement	Non-native species management	Reservoir operations	Biological opinion	RICD	Other	Additional Details	Project Status	Projected Completion	Proponents	Partners	Project Cost	Funding Sources	Challenges
																									of the Yampa			
15	Duffy Canyon river access and riverside camping	Duffy Canyon																		x	Project would establish on-river camping opportunities for float boaters that is currently lacking and additional improvements to river access within Duffy Canyon	Proposed		BLM	Friends of the Yampa, Colorado Parks and Wildlife			
16	Wolery Ditch diversion structure rebuild	Yampa River at Wolery Ditch below James Brown Bridge					x	x												x	Friends of the Yampa has been working with the owners of the Wolery Ditch to prepare for a structural project that would rectify the need to build a push up dam for the ditch every few years. Location would be optimal for an agricultural/recreational partnership as diversion structure would be built to accommodate both attributes.	Proposed	Unknown	Friends of the Yampa/Wolery Ditch owners	Trout Unlimited			
17	New decreed instream flows	Stream reaches throughout the Basin			x																This includes all newly decreed instream flow adjudications applied for by the CWCB (i.e. Red Creek instream flow is currently going through the water court process). Note while these junior decreed reaches may provide protection from future development, regional/system-wide solutions are needed to meet existing instream flow shortages.	On-going	not applicable	stakeholders who sponsor an instream flow for CWCB review	not applicable			
18	Watershed Planning Process	Upper Yampa River and potentially lower Yampa and White River.	x	x		x		x	x	x												Ongoing	Ongoing	Routt County Conservation District	UYCWD, City of Steamboat, Routt County, the Nature Conservancy, others.			



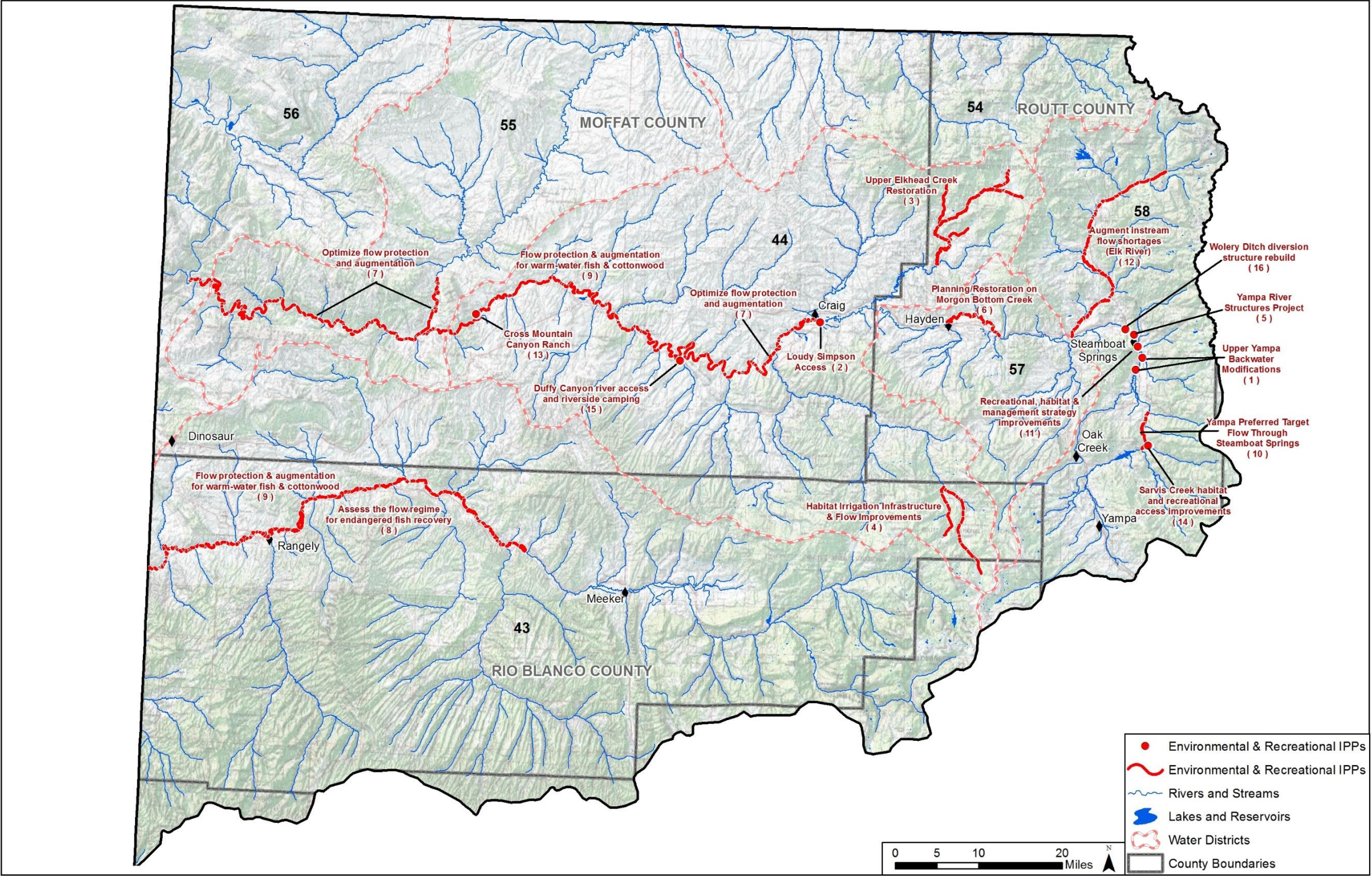


Figure 4-4 Environmental and Recreational IPPs

